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ABSTRACT

This report presents information on how the United States compares with a selected group (N=34) of both industrialized and less developed nations in its spending on higher education and college participation rates. Highlights of the report include: in 1985 the United States spent the highest percentage (2.4%) of gross national product (GNP) on higher education; five countries ranked higher than the United States when overall education spending was measured as a percentage of GNP; with more than 5% of its population enrolled in higher education, the United States had the highest college participation rate; in 1985 the United States spent nearly $8,000 per student in higher education (surpassed only by Denmark); if research and auxiliary enterprises are excluded, U.S. spending would be reduced by about 20%; taxpayer support of higher education in the United States is proportionately lower than in other countries, contributing less than half of total spending per student. Implications are drawn and include the need to consider both spending as a percentage of GNP and spending per student, the correlation between less public support and higher participation in the United States, and the need for better data collection. Graphs and tables detail the report's findings. (DB)

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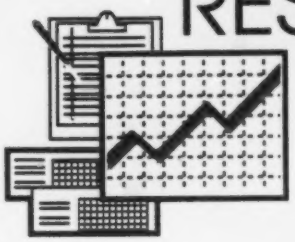

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Division of Policy Analysis and Research
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Higher Education Expenditures and Participation: An International Comparison

Arthur Hauptman, Eileen O'Brien, and Lauren Supina*

Recently, there has been a growing debate among educators and policymakers about where the United States ranks in the world in its willingness to spend money on education. This debate was stimulated in part by a report issued in January 1990 by the Economic Policy Institute (EPI), which compared total education expenditures for a number of countries around the world. The primary focus of the EPI report was elementary and secondary education, but it touched briefly on postsecondary education, noting that the United States spends far more on higher education than any other country.[1]

In this research brief, we clarify how the United States compares in its spending on higher education and college participation rates with other countries around the world. Because countries vary significantly in the structure of their higher education systems, this brief provides rather broad comparisons, examining several measures that might indicate a country's relative effort in providing higher education for its citizenry. Data on expenditures and participation are provided for a selected group of both industrialized and less developed nations as a means for determining where the United States fits into the global pattern.

HIGHLIGHTS

- In 1985, compared to the other countries analyzed in this report, the United States spent the highest percentage (2.4 percent) of gross national product on higher education. Venezuela was the only other country which spent more than 2 percent of its GNP on higher education.
- However, five countries ranked higher than the United States when overall education spending (including K-12 expenditures) was measured as a percentage of GNP (Canada, Denmark, Sweden, Israel, and Morocco).
- Of the countries studied, only Venezuela spent a higher percentage of its overall education budget on postsecondary education (43 percent) than the United States (39 percent).
- With more than 5 percent of its population enrolled in higher education in 1986, the U.S. had the highest college participation rate of the countries studied.
- Canada had the next highest rate, at just under 5 percent. No other country reported having more than 4 percent of its population enrolled in postsecondary education.
- In 1985, the United States spent nearly $8,000 per student in higher education. Denmark was the only country that spent more, expending just over $8,000 per college student, while Australia and Switzerland spent nearly as much as the United States. Other countries varied from a low of $2,000 per student (Italy) to just over $6,000 per student (Japan and the Netherlands).

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- Differences in reporting research and auxiliary enterprises strongly affect reports on spending by various countries. If research and auxiliary enterprises were excluded from the calculation, as is the case in many other countries, estimates of U.S. spending on higher education would be reduced by about 20 percent.

- Differences in the types of students who attend higher education may also affect comparisons between the U.S. and other countries. Some characteristics that may exaggerate the U.S. participation rate include its higher proportions of mature, graduate, foreign and part-time students. Because of these differences, the U.S. participation rate may be overstated by as much as one percentage point.

- Taxpayer support of higher education in America is proportionately lower than in other countries. Public sources of funds in the United States contributed about $3,600 per student in 1985, less than half of total spending per student for higher education. In most other countries, taxpayer support represents well over three-quarters of all higher education funds.

- Nine out of ten of the largest states spent more than $6,000 per college student, which is more than what many industrialized countries spent. Florida was the only one that spent less than $6,000 per student in 1985.

- Only one of the 10 states (New York) spent more than $4,000 per student from public sources in 1985, and each of the 10 states spent less from public sources than most of the industrialized countries.

IMPLICATIONS

- No one measure gives a full picture of a country's higher education effort relative to other countries. Spending as a percentage of GNP places higher education in the context of a country's overall economy, but it does not reflect differences in participation rates among countries, another key component for explaining relative spending effort. Spending per student combines spending and participation measures, but it does not adequately reflect the degree of economic activity devoted to higher education. To get a full picture, both measures of spending should be examined.

- Relatively heavy reliance on private resources may help to explain why the U.S. participation rate in higher education is the highest in the world. The lower degree of public support per student in the U.S. appears to be correlated with the greater number of students attending higher education, while higher public expenditures per student in other countries seem to be linked with lower participation in higher education.

- Policy makers in other countries may therefore wish to look at the U.S. model if they are interested in increasing participation in higher education. Introducing a greater degree of reliance on private resources may allow an expansion of the overall system through greater spreading of public resources. State policy makers in the U.S. also may want to rely on such an analysis in trying to maintain or expand their systems of higher education, especially in an era of increasing demands on state taxpayer dollars.

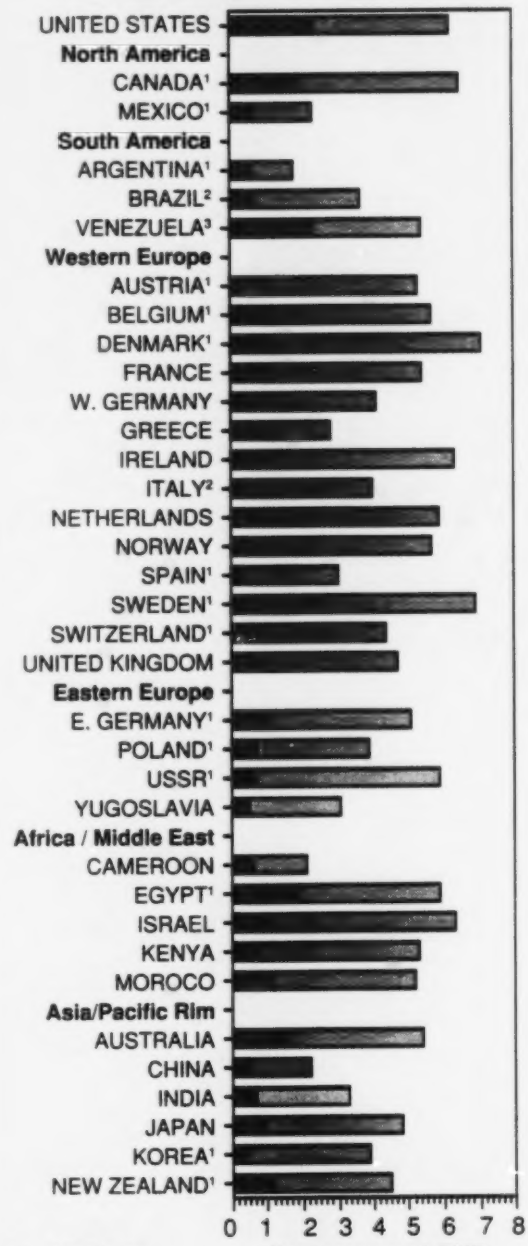
- Better data collection is needed in order to improve international comparisons of higher education spending and participation. The primary data source for this brief was the *Statistical Yearbook* of the United Nations Educational, Scientific and Cultural Organization (UNESCO). Although many researchers have reservations about the UNESCO data, citing discrepancies between data in the *Yearbook* and information from other sources, it remains the only data source of comprehensive education statistics for a large cross section of countries.

Comparing Higher Education Expenditures and Participation

There is no question that, in absolute terms, the United States has the largest system of higher education in the world. It has the most students enrolled (now over 13 million), the greatest number of colleges and universities (over 3,400 institutions), and the highest spending (well over $100 billion).[2] But to compare efforts among countries, it is necessary to place these kinds of figures in the context of the size of a country's population, its resources and its overall higher education participation rate. That is the purpose of this research brief.

Such an international comparison is made more difficult, however, because what is considered higher education differs dramatically from country to country.[3] Nevertheless, the available information does allow us to make some broad international comparisons of higher education funding and participation

Figure 1
Education Spending as a Percentage of GNP, 1985



1 = 1986 data
2 = Based on the total, not current expenditures
3 = 1984 data
4 = 1979 data
5 = 1982 data

Source: UNESCO *1989 Statistical Yearbook*, Tables 4.1 and 4.3

Although there are many points of disagreement in debates over education spending, most observers agree that relative education spending effort among nations may be compared in two basic ways. The first is education spending as a percent of a nation's economic activity, as measured by its GNP.[4] The second measure is how much is spent per student. Neither method is foolproof, but each has a value in the perspective it presents.

Education spending as a percentage of GNP helps to show how much of a country's economic activity is devoted to higher education, but it does not reflect differences among countries in the proportion of the population enrolled in college. Furthermore, it does not show to what extent the proportion of the economy devoted to higher education is a function of the number of students who enroll. Spending per student takes into account differences in participation, but it does not reflect the relative economic effort devoted to education. Since neither figure tells the full story, in this research brief, we compare higher education spending among various countries using both measures.

Higher Education Expenditures as a Percent of GNP

- In 1985, the United States spent 2.4 percent of its GNP on higher education (figure 1), the highest proportion of any of the countries studied. Venezuela spent almost as much, allocating 2.3 percent of its GNP toward higher education. The countries with the next highest percentages were Canada and Egypt, which both spent just under 2 percent of their GNP on higher education.

The United States does not rank as high when total education expenditures (including K-12 as well as higher education) are measured as a percentage of its GNP.

- In terms of total education spending, the United States spent 6.2 percent of its GNP, ranking below five other countries: Sweden (6.9 percent), Canada (6.5 percent), Morocco (6.4 percent), Ireland (6.3 percent), and Israel (6.3 percent).
- In the U.S., higher education spending comprised 39 percent of total education expenditures in 1985 (table 1). The only country dedicating a higher proportion of its education budget to higher education was Venezuela, with 43 percent.[5]
- The share of education spending devoted to higher education has an impact on a country's relative spending effort on higher education. For example, Israel spent slightly more (6.3 percent) of its GNP on education than the U.S., but only 20 percent of its education budget (roughly half of the United States' proportion) on higher education, so that it spent less of its GNP on higher education.

Participation in Higher Education in Different Countries

The fact that the United States spends a larger percentage of its GNP on higher education than any other country surveyed can reasonably be interpreted to mean that the U.S. invests more in higher education than many other countries. It also may indicate that a higher percentage of the population in the United States participates in higher education than in any other country. Thus the reason that the United States spends a higher proportion of its GNP on higher education may well be a function of its larger enrollments.

- In 1986, the nearly 13 million students enrolled in higher education represented 5.1 percent of the total U.S. population — a participation rate higher than any other country (figure 2).

- Only Canada, at 4.9 percent, approached the participation rate of the U.S. No other country had more than 4 percent of its population enrolled in higher education in that year.

- A more typical measure of participation is the proportion of students of traditional college age who are enrolled in higher education. In the United States, for example, over one-third of all 18 to 24 year old high school graduates are enrolled in college. The U.S. figure is probably the highest in the world, but statistics on this measure of participation are not collected uniformly to allow for international comparisons.[6]

Spending per Student for Selected Industrial Countries

There are several ways in which expenditure and participation rate figures can be combined to provide a broader perspective of a country's higher education efforts. The EPI report compared countries on the basis of the percentage of their GNP spent on education, as adjusted for differences in enrollment. This method has the advantage of merging expenditure and participation figures while stating everything in terms of a country's own currency; no adjustment is needed to reflect different currencies. But the concept of education spending as a percentage of GNP adjusted for enrollment is not one that is easily understood. Nor does it provide a sense of how much a country is spending on higher education.

Calculating expenditures per student is another way to combine measures of spending effort with differences in rates of participation. It is particularly useful because it is sensitive to changes in both spending and enrollment. As a result, spending per student is frequently used to gauge a country's educational spending effort. Although this method requires an adjustment to reflect differences in currencies, it has the advantage of being easy to understand and commonly used. For these reasons, we have employed spending per student as a measure of relative higher education effort.[7] From this we derive two important data:

- In 1985, the last year for which data from different countries is consistently available, the United States spent nearly $8,000 per student in higher education, one of the highest amounts of any of the countries reviewed in this report (figure 3).[8]

Table 1
Higher Education Spending As a Percentage of All Education Spending, 1985

UNITED STATES	39.4	GREECE	20.1	**Asia/Pacific Rim**	
North America		IRELAND	17.7	AUSTRALIA	30.5
CANADA	28.8	ITALY	10.1	CHINA	21.8
MEXICO	31.8	NETHERLANDS	26.4	INDIA	18.7
South America		NORWAY	13.5	JAPAN	21.4
ARGENTINA	30.8	SPAIN	14.0	KOREA	10.3
BRAZIL	19.6	SWEDEN	12.3	NEW ZEALAND	27.4
VENEZUELA	43.4	SWITZERLAND	18.9		
W. Europe		UNITED KINGDOM	19.8	**Middle East/Africa**	
AUSTRIA	18.8	**E. Europe**		CAMEROON	22.3
BELGIUM	17.8	E. GERMANY	22.4	EGYPT	32.7
DENMARK	20.7	POLAND	18.1	ISRAEL	20.4
FRANCE	12.6	U.S.S.R.	12.6	KENYA	12.4
W. GERMANY	20.8	YUGOSLAVIA	15.3	MOROCCO	18.9

Source: United Nations Educational, Scientific and Cultural Organization, *1989 Statistical Yearbook*, Table 4.3.

- Denmark's funding per student was the highest of all, with just over $8,000 spent on each student. Australia spent the third largest amount, roughly $7,900 per student in higher education.

Concerns About Comparability in Expenditures and Participation

As already noted, the figures used in this report have been drawn principally from the UNESCO *Statistical Yearbook*. While UNESCO attempts to make the *Yearbook* figures as comparable as possible, there are still a number of ways in which both the expenditure and participation data reported are not the same across countries.

Differences in the Reporting of Expenditures

Spending comparisons among countries can be deceiving in that various countries account differently for their higher education expenditures. The two principal differences are in the accounting for research and auxiliary enterprises.[9]

- ***Research.*** One potential difference in comparing the spending figures of different countries is whether research dollars are included in education spending estimates. The United States includes research as part of the education budget, and research expenditures constitute nearly 9 percent of total spending. Yet other countries often omit research from education spending, including it instead as a separate category.

- ***Auxiliary Enterprises.*** Another difference is in the accounting of auxiliary enterprises such as hospitals and dormitories. In many countries, such expenditures are not included as a cost of education, while in the U.S., they are.

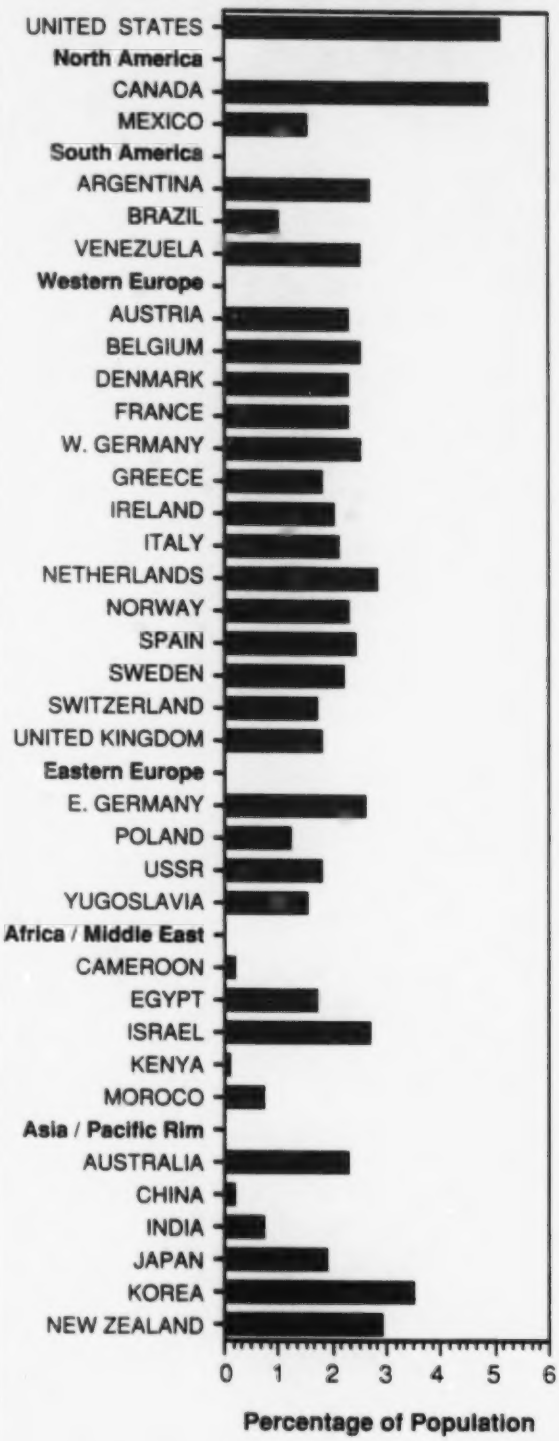
These differences in accounting procedures tend to distort international comparisons of higher education expenditures. From the existing data sources, however, it is not possible to make expenditure data comparable in all cases.

- As a rough proxy for comparability, if research and auxiliary enterprises were not included, the U.S. expenditure figure would be reduced by roughly 20 percent.

Factors Influencing Participation Rates

There is little question that the United States has the largest number of students enrolled in higher education and the highest participation rates, yet certain aspects of American higher education tend both to overstate and understate U.S. participation rates relative to other countries. These factors include:

Figure 2
Higher Education Enrollments as a Percentage of Total Population, 1986



Source: UNESCO *1989 Statistical Yearbook*, Tables 3.11 and 1.1

- ***The Prominence of Community Colleges.*** Roughly one-third of all U.S. enrollments are in community colleges, whereas many other countries do not have a community college system or its equivalent. Some argue that the level of skills taught in the first year of American community colleges (as well as some four-year colleges and universities) is obtained in the secondary education level in many European countries. Some of the programs at U.S. community colleges would more closely parallel certain secondary school education and training or non-academic apprenticeship programs in other countries.

- ***Part-time Students.*** American students are more likely to attend college on a part-time basis than students in most other countries, possibly due to the high cost of college in the U.S. Students in other countries, where typically no or little tuition is charged, may have less reason to work while acquiring their education, and thus usually choose to attend school on a full-time basis. The data on full-time/part-time status of students in other countries is sketchy at best.

  - Data from the Organisation for Economic Cooperation and Development (OECD) indicate that Canada, with 38 percent of students attending part-time, is closest to the U.S. rate of 43 percent.

  - If enrollments were reported on a full-time equivalent basis, the ratio of enrollments to population in the U.S. would drop from 5 percent to 3.8 percent, much closer to that of some other countries.

- ***Graduate enrollments.*** Graduate students represent a much larger share of total enrollments in the United States than in most other countries. More than 1.7 million students (14 percent of all American college students) were enrolled in postbaccalaureate programs in 1987.

  - By contrast, graduate students represented less than 10 percent of all students in most other countries studied in this brief.[10]

- ***Foreign enrollments.*** In 1986, 350,000 of all students enrolled in U.S. colleges and universities were foreign — the largest number among 25 countries studied by the Institute of International Education.[11] And the data indicate a continuing trend of increasing foreign enrollment in U.S. colleges and universities.

  - France had the second highest number, with 127,000 foreign students, and all other countries had significantly less than 100,000 foreign students.

- ***Older Students.*** Over two-fifths of all U.S. college students are 25 years of age or older, which is one of the highest proportions of older students of any country, at least with respect to those enrolled in degree programs. Only Sweden has a decidedly higher proportion of older students.

  - A different picture emerges, however, when the enrollment of all older students, including non-degree students, is examined. At least five other countries have a higher percentage of more mature students than the U.S.: Sweden, Finland, Canada, Australia, and the United Kingdom.[12]

- ***Vocational Student Participation.*** Each of the differences discussed above contribute to an overstatement of U.S. participation rates relative to other countries. The counting of students in vocational programs, however, moves in the other direction. While students in vocational programs at community colleges are included in U.S. higher education enrollment figures, students in proprietary trade schools for the most part are not. By contrast, many other countries do include these students in their higher education enrollment statistics.

Taken together, these differences in participation measures tend to overstate the U.S. rate relative to other countries.

- As a rough approximation, we estimate that the proportion of the population enrolled in higher education would be at least one percentage point lower if the U.S. system were structured similarly to that of most other countries.

Participation figures also will influence estimates of spending per student. To the extent that U.S. participation is overstated, spending per student is understated since the number of students enrolled is the denominator for the calculation.

- If, as we have suggested, enrollments would be roughly one-quarter less if the U.S. used the same measurements as many other countries, then U.S. spending would be $11,000 per student, rather than the $8,000 per student figure used in this report.

The preceding analyses make it clear that, even adjusting for differences in accounting and structure, when total higher education spending is measured as a percentage of GNP or on a per student basis, the United States ranks at or near the top of countries around the world.

Taxpayer Support for Higher Education

The biggest difference between American higher education and that of other countries is its dependence on private resources.

- The United States is one of the few industrialized countries in which nongovernmental expenditures constitute a sizable proportion of total spending for higher education.

- Nongovernment sources constitute well over half of the total revenues of all American institutions of higher education. For independent colleges and universities, private funds represent three-quarters or more of total revenues.

- Of the other industrialized nations, only Japan, where tuition represents a large share of total revenues, derives a significant proportion of revenues from private sources.

- In addition, in a number of less developed countries in Latin America, India, and the Philipines, private resources represent a substantial share of total higher education spending.

- When only public revenues are considered, the U.S. support per student in 1985 was $3,613, less than half of the total spending per student (figure 4).

- Based on public expenditures, the United States would rank below a number of other industrialized countries. For example, higher education spending in Denmark and Australia, where public resources constitute virtually all of the support for higher education, spending per student is more than twice that of public expenditures per student in the United States.

- In fact, when public support is examined, it appears that most of the other industrialized countries spend more public dollars per student on higher education than does the United States (compare figures 3 and 4).

Not surprisingly, total and public taxpayer support per student in the U.S. vary considerably between public and independent institutions (figure 4).

- Independent institutions receive far less than half of their total revenues from public sources. Spending per student at independent institutions was $12,655 in 1985, nearly twice that of the $6,701 at public institutions.

- When only government sources of funds are considered, revenues per student at public institutions were $3,959, roughly twice the level of public expenditures per student at private institutions ($2,095). [13]

Spending in Selected States Compared to Industrialized Countries

Just as countries vary greatly in their support of higher education, so do states within the United States.

- Of the 10 largest states, only Florida spent less than $6,000 per student in 1986, ranking it below several of the industrialized countries (compare figures 3 and 5).

- On the other hand, several states, including Pennsylvania, New Jersey, and New York, spent more per student than most of the other countries, including Australia and Denmark.

- As in the case of the U.S. as a nation, public taxpayer support in the 10 states was one half or less of total expenditures per student. As a result, public expenditures in the 10 states were less than that of most of the industrialized nations, with the exception of Italy, Ireland, and France.

IMPLICATIONS

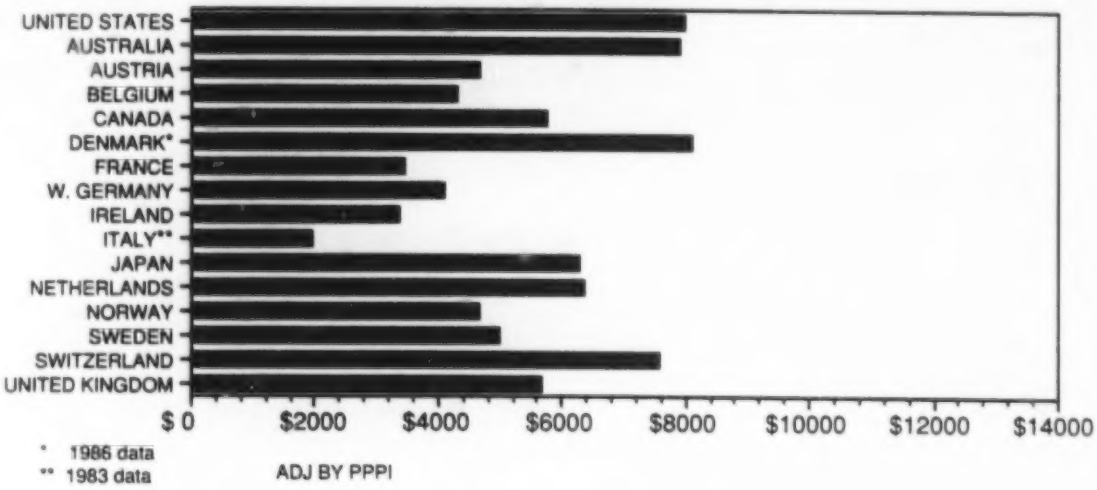
This review of international statistics on higher education makes it clear that the United States ranks at or near the top of the world in how much it spends on higher education and in the proportion of its population that participates. These data confirm the general impression that the American system of higher education is the largest in the world.

But the statistics can be deceiving. Education spending as a percentage of a country's GNP is indicative of a country's effort relative to its overall economy, but it does not take into account the degree of participation in the system. A country may devote a relatively high proportion of its GNP to higher education because it has more students or because it spends more per student. That is why expenditures per student is another important indicator of a country's higher education effort. Both spending measures are helpful in telling the story, but neither is sufficient to give a full picture.

These data suggest that the high participation rate of the United States is correlated with its small degree of taxpayer support relative to total spending for higher education. Less than half of total higher education spending per student in the United States comes from the public sources of the federal, state, and local governments.

Higher Education Expenditures per Student, 1985

Figure 3 –For Selected Countries



* 1986 data
** 1983 data

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Figure 4 –For U.S. Public and Independent Institutions

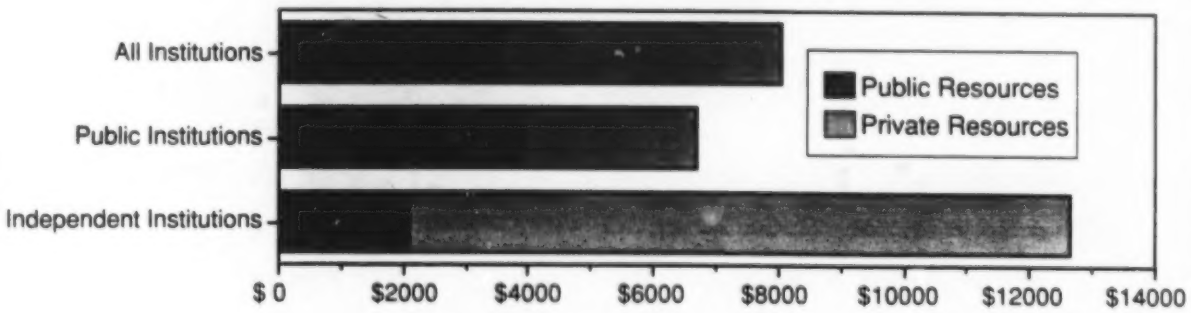
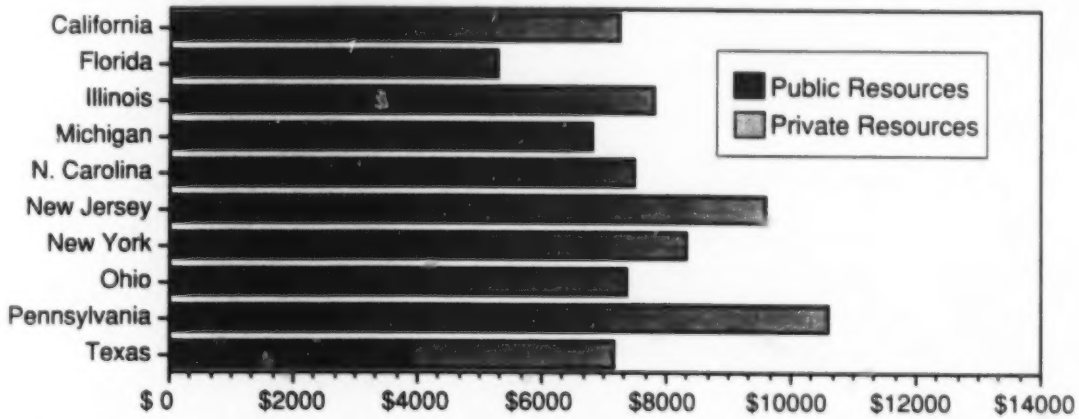


Figure 5 –For Ten Largest States



Sources: UNESCO *1989 Statistical Yearbook*, Tables 4.1 and 4.3. U.S. Department of Education, *Digest of Education Statistics 1989*, Tables 166, 274, and *State Higher Education Profiles, 1988*.

This financing approach of mixed public and private support, which among industrialized countries is limited principally to the United States and Japan, allows the United States to spread its resources further by providing relatively little taxpayer support per student. Although the United States ranks in the middle among industrialized countries in its taxpayer support per student, it ranks at the top in terms of total expenditures per student and in the proportion of the population that participates in higher education.

This correlation — limited public support with a high participation rate — would suggest that the greater use of private resources may be allowing American taxpayer resources to be spread more widely than in countries where there is much less private support of higher education. Other countries might wish to consider the experience of the United States if they are interested in increasing their own degree of participation in higher education.

Charging no or little tuition and depending almost entirely on public taxpayer dollars to pay for higher education are two fundamental tenets of the higher education systems of most countries of the world. Yet, given that all countries are subject to resource constraints, spending more taxpayer dollars on one student means less may be available for others. Put another way, the more a country spends in public dollars per student, the fewer college slots it can offer within a given budget.

State policy makers in the United States also may want to evaluate these international comparisons as they look to the future. Devoting more dollars to each public college student in their state may limit their ability to expand overall public college enrollments. This may be true especially in the early 1990s, as states face increasing claims on taxpayer dollars for prisons, elementary and secondary schools, health care, and other growing needs.

Better data collection is needed in order to make further comparisons of postsecondary education expenditures and participation among countries. Despite criticism from several researchers who say that UNESCO data are suspect, the UNESCO *Statistical Yearbook* remains the only source that provides comprehensive education statistics for a large cross section of countries. Much work still is needed to achieve better comparability in both spending and participation data, and improved statistics are necessary on several different factors such as the mix of part-time/full-time students, degree completion rates, etc.

ENDNOTES

1. Rasell, M. Edith and Lawrence Mishel, *Shortchanging Education: How U.S. Spending on Grades K-12 Lags Behind Other Industrial Nations*, Washington, D.C., Economic Policy Institute, 1990.
2. U.S. Department of Education, *Digest of Education Statistics*, Washington, D.C: Government Printing Office, 1990.
3. Even the term "higher education" can be a source of confusion. The UNESCO *Statistical Yearbook* uses the term "third-level" education to describe education beyond the secondary level, while Organisation for Economic Cooperation and Development (OECD) documents refer to "higher education." In the U.S., "higher education" typically refers to collegiate education, while postsecondary education includes vocational training in proprietary schools as well. In this research brief, the U.S. definitions are observed.
4. Rather than using GNP as a basis for comparing the educational effort of different countries, the EPI report calculated education expenditures as a proportion of gross domestic product (GDP), which is derived by subtracting a country's trade surplus or deficit from its GNP.
5. The Venezuela figure is for 1984.
6. The UNESCO *Yearbook* does include a statistic on the participation of traditional college-age students. That figure is computed by dividing the total number of students (including those who are not of traditional age) by the population of traditional college age. On this statistic, the U.S. does surpass other countries, with the roughly 13 million students representing 60 percent of the more than 20 million 18 to 24 year old Americans. Canada had the next highest rate of 55 percent. Every other country had 40 percent or less. But this statistic at best should be viewed as only a rough indicator of participation, since it includes people in the numerator who are not counted in the denominator. It clearly favors countries like the U.S. with a large proportion of older students.
7. In comparing expenditures per student among countries, differences in national currencies may be adjusted two ways. One is to adjust expenditures by international exchange rates. The second method is to use the Purchasing Power Parity Index (PPPI), a measure established to minimize inequities that result from using international monetary comparisons. It serves as an international version of the consumer price index by comparing a market basket of goods and services in different countries. Because the PPPI was developed precisely for the purpose of providing a framework for comparing the relative purchasing power of different currencies, it is used in this analysis of spending per student.

[8] The figure normally reported for expenditures per student in American higher education is in excess of $10,000. The source of this discrepancy is that the traditional U.S. spending per student figure uses full-time equivalent students as the denominator in the calculation. The UNESCO figures, however, use head counts as the measure of enrollments. To be consistent, estimates in this report use headcount enrollments as well.

[9] Another potential source of noncomparability is the variation in how countries account for capital investments such as physical plant and equipment. In some, capital spending is included with the "other expenditures" category in the UNESCO *Yearbook*. In others, including the U.S., capital expenditures are reported separately from operating expenses. In this report, we have used the current funds expenditure data for the U.S., which does not include capital investment. To the extent that capital funds may be included in data for some of the other countries studied, the difference between the U.S. and other countries may be understated.

[10] Blume, S. and O. Amsterdamska, *Post-Graduate Education in the 1980s*. Paris, France: Organisation for Economic Cooperation and Development, 1987. In East Germany and Norway, the percentage of students in graduate school surpasses the U.S., with more than 35 percent at that level.

[11] Zikopoulos, Marianthi, Editor, *Open Doors, 1989-1990: Report on International Educational Exchange*. New York: Institute of International Education, 1990.

[12] Centre for Educational Research and Innovation, *Adults in Higher Education, A General Report*. Paris: Organisation for Economic Cooperation and Development, 1987.

[13] U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics 1990*. Washington, D.C.: Government Printing Office, 1990.

CALCULATION NOTES ON FIGURES

Figure 1. Statistics, figures, and tables in this report were based on data from UNESCO, and focus specifically on current education expenditures, rather than on total education expenditures, as the EPI report does. In addition, the calculations in this paper differed from the EPI report in the use of GNP rather than the gross domestic product as a measure of education's portion of national economic activity. These calculation variations led to somewhat different GNP percentages than in the EPI report.

Figure 2. The proportion of the population enrolled in higher education was derived by dividing total higher education enrollments by total population.

Figure 3. Expenditures per student were calculated for each country by multiplying the figure for current education expenditures from the UNESCO *Statistical Yearbook* by the percentage of education expenditures devoted to higher education. This produced an estimate of higher education expenditures, which was then divided by UNESCO's enrollment figure for each country, to arrive at an expenditure per student in the country's currency. Multiplying these figures by the available Purchasing Power Parity Index (PPPI) for 1985 resulted in the expenditure per student in U.S. dollars. Again, the use of current education expenditures rather than total expenditures, along with the use of PPPI rather than exchange rates to develop comparable per student expenditure figures, led to somewhat different statistics and results than the EPI report.

Figure 5. Expenditures per student for the ten largest states were calculated in a similar way. Using data from the National Center for Education Statistics, current fund revenues were divided by head count enrollment figures to determine overall expenditures per student. To calculate public expenditures, federal, state, and local revenues were divided by enrollment.

RESOURCES

1. The 1989 *Statistical Yearbook*, published by the United Nations Educational, Scientific and Cultural Organization (UNESCO), is the primary source for this research brief. The *Yearbook* compiles data for more than 200 countries on population, education and cultural issues, based on questionnaires and special surveys conducted by UNESCO. This paper recognizes that potential inaccuracies exist in the *Yearbook's* data, such as data not being available for consistent years, and in some instances, the data in the *Yearbook* do not agree with data supplied by other sources. Also, most data tables are incomplete because countries did not or could not supply the information asked for. In other cases, the *Yearbook* has no expenditure or enrollment data at all. However, an alternative data source providing information on a number of countries cannot be found. The following tables were utilized: Tables 1.1, 3.11, 3.13, 4.1, and 4.3. For more information, contact United Nations Educational, Scientific and Cultural Organization, 7, place de Fontenoy, 75700 Paris, France.
2. A second source of international comparisons of education participation and expenditures can be found in the U.S. Education Department's *Digest of Education Statistics*. However, the tables in the *Digest* are drawn from UNESCO data, so they are subject to the same problems mentioned above. For more information, contact the Government Printing Office, Washington, D.C. 20402.

3. The Organisation for Economic Cooperation and Development publishes monographs on education funding in various countries. Currently, papers on the following countries are available: Denmark, Finland, France, Greece, Japan, Norway, Spain and the United States. For a catalog of OECD publications, contact the Organisation for Economic Cooperation and Development, Publications and Information Center, 2001 L Street NW, Suite 700, Washington, D.C. 20036, (202) 785-6323.

4. Although somewhat dated, in 1988, the Congressional Research Service published a comprehensive analysis of international education expenditures and other characteristics, *Comparative Education: Statistics on Education in the United States and Selected Foreign Nations*, which also focused on how these characteristics affected each country's overall math and science achievements. This report also provides more information on elementary and secondary funding. Contact the Education and Public Welfare Division, Congressional Research Service, Madison Building, Room LM 320, Library of Congress, Washington, D.C. 20540.

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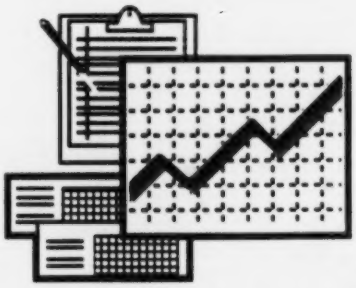

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